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Original Article

More objective diagnoses of venous thromboembolism?

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The clinical diagnosis of deep venous thrombosis is non-specific, i.e. suffers from a large number of false-positive diagnoses. Therefore, the use of objective tests is emphasized. We have investigated retrospectively the increase, if any, in the use of objective tests over a three year period in the Leiden area (1986–1989).

We found that the percentage of patients on whom objective tests were used was more than doubled, from 21% to 55%; this increase was accompanied by a 29% decrease in the incidence of venous thromboembolic disease. These opposing trends are to be expected if more objective tests are used. Neth J Med 1991;38:246–248.

Key words: Venous thrombosis, Objective diagnostic methods

Introduction

A major problem in the diagnosis of venous thromboembolism (deep-vein thrombosis and pulmonary embolism) is that the clinical diagnosis is far from accurate It has been reported that the proportion of patients incorrectly labelled on clinical grounds with these diagnoses (false positives) varies from 50 to 70% [1,2] Thus, if we relied on clinical diagnosis only, a large number of patients would be treated with anticoagulants unnecessarily, entailing risk of bleeding and high costs [3] In April 1986 a consensus development meeting was held in The Netherlands on the use of diagnostic tests for venous thromboembolism, in which the participants concluded that objective diagnostic tests should be employed in all patients in whom venous thromboembolism is suspected [4].

We performed two studies to find out about the increase, if any, in the use of objective tests since the consensus meeting in 1986

Materials and Methods

The first study included 50 subjects who were randomly selected (by means of a random number table) from all consecutive patients ($N = 404$) referred because of a first venous thrombotic event to the Leiden Thrombosis Service in 1986. As described elsewhere [5], each Thrombosis Service in The Netherlands serves a well-defined geographical area, which, for the Leiden Thrombosis Service, has about 450,000 inhabitants A questionnaire was sent to the patient's physician, with a request for information on how the diagnosis had been made. A second, identical study was performed three years later Seventy subjects were randomly selected from all consecutive patients

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with a first venous thrombotic event in 1989 ($N = 287$) or in the first three months of 1990 ($N = 59$). Since we used patients registered at the Thrombosis Service Leiden once again, they were all inhabitants of the same, well-defined geographical region.

Results

Eleven subjects were excluded from the study in 1986, and eight in 1989/90, for the following reasons: a history of previous venous thromboembolism (5 and 3), anticoagulant treatment for other indications than venous thromboembolism (1 and 3), or they had moved house (5 and 2). Our analysis included 39 subjects for the first study and 62 subjects for the second study.

In the first study we received replies on 24 patients (62%) and in the second study on 40 (65%). The diagnostic tests reported were contrast venography, ultrasonography, Doppler ultrasound and impedance plethysmography for DVT; and for the diagnosis of pulmonary embolism chest roentgenogram, pulmonary angiography, ventilation and perfusion lung scans. All these, except for chest roentgenograms alone, were considered objective tests. In the first study objective diagnostic tests had been employed for five subjects (21%), whereas in the second this number was 22 (55%) (Fig. 1).

Fig. 1 shows the number of subjects with a first venous thrombotic event entering the Thrombosis Service for anticoagulant treatment, a number which decreased by 29% in the three-year period.

The non-response in both studies was 38 and 35%, respectively. It may be argued that the non-responders were the physicians who preferentially did not use objective tests. To see whether this was true we performed a non-response study by mailing a second request and if necessary by perfor-

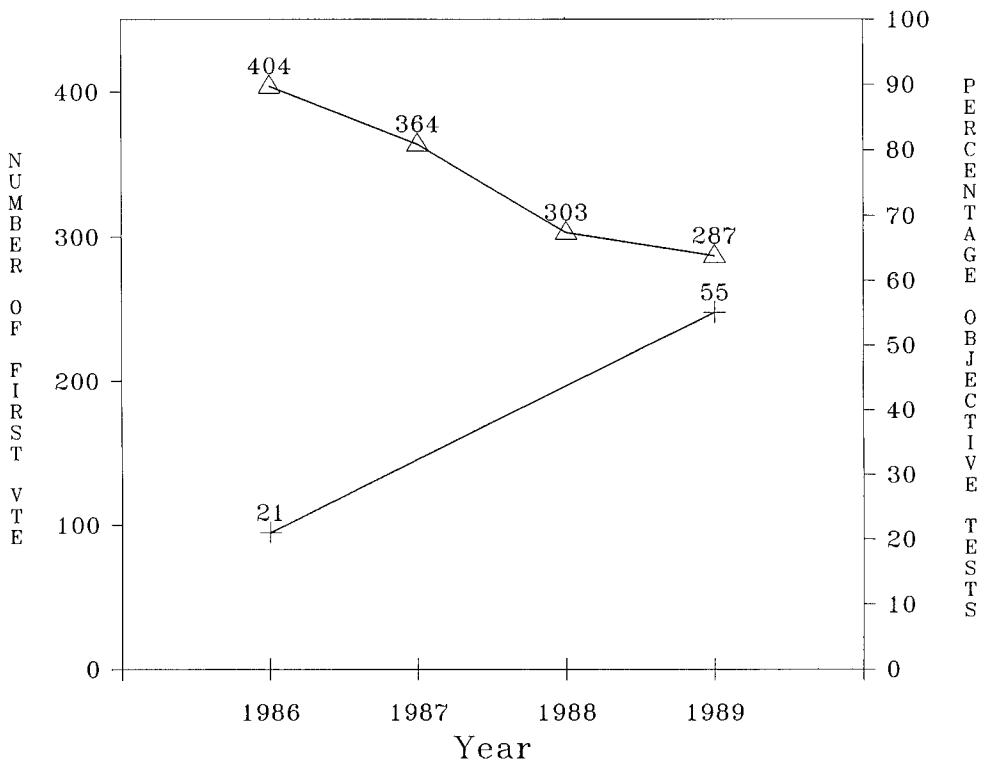

Fig. 1. The number of patients (△) and the use of objective tests (+) in diagnosing venous thromboembolism in patients entering the Thrombosis Service after a first venous thrombotic event (VTE), plotted against time.

ming a third request by telephone for information to all non-responding physicians of the second study. After these requests the response increased to 59 subjects (95%). In 36 of them (61%) objective diagnostic tests were used. This result indicates that the non-responders were not necessarily the physicians who relied only on the clinical presentation.

Discussion

We found an increased use of objective diagnostic tests for venous thromboembolism (by 34%) accompanied by a decrease in the number of registrations for anticoagulant treatment after a first venous thrombotic event in the Leiden Thrombosis Service (by 29%), in a period of three years. These opposing trends are to be expected if more objective tests are used by physicians who see the patient first. Presumably this will lead to fewer patients being treated unnecessarily.

In addition, these data provide ever better estimates of the incidence of diagnosed venous thromboembolic disease: 1986: 90 per 100,000 per year; 1987: 81 per 100,000 per year; 1988: 67 per 100,000 per year; and 1989: 64 per 100,000 per year. Since virtually all patients with a diagnosis of venous thrombosis or pulmonary embolism are treated with oral anticoagulants and this treatment is always controlled by the Leiden Thrombosis Service (unless the patient dies in the hospital shortly after the event), these estimates are reasonably accurate. With further introduction of objective diagnostic methods we expect that the true incidence of symptomatic venous thromboembolism will prove to be in the order of 50 per 100,000 per year. This educated guess was calculated by adding all objectively diagnosed patients to 50% of the remaining referred patients, since half of these are expected to be false positives. Subsequently, the total number of patients is divided by the total population in the Leiden region. When we apply this calculation to our results of 1986 and 1989, strikingly similar estimates result: 54 per 100,000 and 49 per 100,000, respectively.

In conclusion, we think a growing consensus is developing in the diagnosis of venous thromboembolism. While it is impossible to ascribe this effect to the 1986 consensus meeting with certainty, a beneficial influence is highly likely.

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